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ABSTRACT

This paper reviews recent developments in the technology relating to microcomputer printing of the Cyrillic alphabet and related forms of Roman alphabet with diacritics used in Slavic and East European languages. The review includes information on the capacities of printers, computers (particularly the display capabilities), and interfaces (software and microchips). Speed, costs, copyrights, and print quality are among the features considered. (MSE)

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Printing Cyrillic and Other "Funny Characters" from a Computer

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During the period of slightly more than one year since I spoke at the AAASS panel on microcomputers, the situation with printing Slavic alphabets and seeing them on the screen has improved considerably, although no fully satisfactory system exists yet. Throughout this paper, when I refer to printing or seeing Cyrillic, I am at the same time referring to the Latin-alphabet Slavic and East European languages; "Cyrillic" is simply shorthand for "Cyrillic and Roman with diacritics."

There are three components to the problem: the printer, the computer (particularly the display [monitor, CRT]), and interfacing the two. Since in the approximately twenty minutes allotted to this paper, I cannot give an exhaustive survey, I will simply try to give some of the possibilities. Persons who want more information should refer particularly to the excellent survey of foreign-language word-processors published by Robert Baker in the Calico Journal. Unfortunately, because of the great speed of innovation in the microcomputer field, this survey is already somewhat out of date. No similar survey exists for printers, and the introduction of new laser printers and graphics boards at the most recent Comdex in November has confused the situation still further. The upcoming introduction (in January) of new models of the Macintosh computer and the Laserwriter printer by Apple Computers will change things once again.

The ideal system is one where the Cyrillic characters can be seen and manipulated on the screen and then printed out. A limited number of systems can do this. The best-known of these is the Apple Macintosh, coupled with the Imagewriter or Laserwriter printers. The screen display on the Macintosh has excellent sharpness, but the printing is not as satisfactory. The Imagewriter produces copy that is quite adequate for letters, but is not acceptable for reproduction (even though a number of newsletter publishers are doing so), and many editors would object to reading a long manuscript printed on the Imagewriter. The Laserwriter produces much better resolution (definition), but, according to one of Slavica's authors, who has been working intensively with it, does some funny things to the Macintosh fonts. The Laserwriter also costs $6,000, which puts it out of the range of individuals and even most Slavic departments. A similar system for the Apple IIe is Gutenberg (used for the AATSEEL newsletter), but again the resolution is less than satisfactory.

IBM compatible machines have the most possibilities: I will discuss only four, all of which I have seen in operation. A number of others are on the market, but I don't know anyone who is using them and have not been able to see them in action. The first one is AcademicFont, a word processing program that uses a ROM chip replacement to give a complete Cyrillic set,

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including OCS characters. Making the chip replacement means that one loses part of the IBM character set, however, and the program works well only with quite expensive dot-matrix printers. Xenotechnics has a chip replacement that allows one to use either Cyrillic or English on the screen, but not both at the same time. One can print both alphabets simultaneously, although one must choose a single Cyrillic set, rather than a pan-Cyrillic, and Roman-alphabet East European languages are not provided for. The greatest advantage of the Xenotechnics system is that one can use regular software, such as WordStar, InfoStar, etc., that one may already have. This software also has a wide range of supporting programs to do such things as create indices, footnotes, bibliographies, etc., and it is widely used already. Proofwriter allows one to do Cyrillic on the screen and print it, but it works only with the IBM color graphics card, which gives very blurry, hard-to-read text on the screen. The disadvantage of AcademicFont, the Xenotechnics system, and Proofwriter is that the first two depend upon a chip and the third is copy protected. In all three cases, if something happens to your chip or disk, you may have to wait some time for a replacement before you can use your files again, and if the company has gone out of business, which is very common in the microcomputer industry, you may simply not be able to get a replacement. There are also differences in the ease of use, power, and compatibility of the software, but that is too complicated to go into here. Caveat emptor!

Nota Bene, which has been endorsed by the MLA, is about to come out with a Russian font, but it is at present Russian only and can be used only with the Toshiba 1351 dot matrix printer, a rather expensive one. It also requires a special graphics card (either the Quadvue or IBM EGA card), so the added expense is substantial. Nota Bene promises to be the most viable system, in my opinion, once they get the new version out and the hardware becomes less expensive. Since Nota Bene is not copy protected and does not involve a ROM chip replacement, one can make backups and be sure of being able to use the program at any time. Nota Bene plans to support the Hewlett-Packard Laserjet Plus printer, which means that one should be able to produce output of almost typeset quality, although at present the cost is not cheap: one needs an IBM-compatible computer (the best value, I believe, is the Leading Edge Model D, but it is still $1495), a special graphics board (the EGA clones are about $500 as of this writing), Nota Bene costs $495, and the Laserjet Plus costs $3995. This gives a total of about $6500 at list price, which is a bit much for most college and high school teachers. Nota Bene also plans to produce an extended character set to handle all Slavic and East European languages, in both the Cyrillic and Roman alphabets. Nota Bene is a very powerful program which includes both a word processor (XyWrite, considered to be one of the best high-powered programs) and a data base program (FYI 3000, a text-oriented program which is more suitable for academic writing than the type of program represented by the better-known data base programs such as dBase II), and as such it requires a good deal of learning. As prices for the hardware come down, Nota Bene should find a good market among academics with serious word processing needs.

Among CP/M (8-bit) machines, two systems should be noted. The Chartech system makes a ROM chip for Kaypro computers which allows the Cyrillic to be seen on the screen and printed out on Toshiba printers. Again, there are two disadvantages: the ROM chip change and the need for a relatively expensive printer. On the other hand, the Kaypro computer is cheap and the quality of print seems to be very good. I have not seen the system in action, but have received a letter written with it.

The second CP/M system to note is the Epson QX-10 and QX-16 with Valdocs. Valdocs, which in its first two versions (1 and 2), was slow and somewhat buggy, although exceedingly easy to use (my wife has used it to write several long research papers without ever opening the manual), is now available in the Plus version, and it works exceedingly well. In addition to the normal full set of characters for the computer, one can compose a full set of alternate characters in both upper and lower case (96 in all) that both appear on the screen and can be printed out on an Epson FX series printer (currently available for about $350 discount). The screen resolution is very high (better than the IBM monochrome standard, and twice as good as the IBM color card), and the print quality is good, although not up to the Toshiba standard. If one wants higher print quality, one can go to the Epson LQ-1500, a 24-pin printer that produces very high quality output similar to that of the Toshiba. A utility is provided with Valdocs that makes producing alternate character sets extremely easy. The disadvantage to the QX-10 is that it is an 8-bit computer, and so cannot run much of the newer software that is coming out. It's also out of production, but is still available at very low prices (Slavica bought its latest one for $750 complete). Epson is a division of the Seiko watch company, and the computer is built like a Seiko watch (as you can gather, I think it's a great machine, and Slavica has several). The QX-16 is still available, but is not, in my opinion, a very good buy at current prices (if discounted sufficiently, as it probably will be soon, it could be a very good buy, since it runs both 8-bit and 16-bit software, although the 16-bit half is not fully IBM-compatible; again, caveat emptor!) Valdocs is supposed to appear next year for the Atari 520ST, which retails for $795; the machine is very powerful, and it could become a strong contender if the promised software support materializes.

There are some systems that run on other machines, such as the Commodore, but I do not consider them as viable for serious writing. If you are a do-it-yourselfer, there are also other options, such as building screen characters using the IBM EGA card or the Quadram Quadview card, and creating printer characters by downloading. Some of the new laser printers, such as the Quadram Quadlaser, come with font construction facilities similar to those provided with Valdocs or Fancy Font.

Several programs are printer oriented. The most powerful of these by far is Fancy Font, which is a complete typesetting program that works on both 8-bit and 16-bit machines (CP/M and MS-DOS). It allows one to put the text into the computer with a variety of word processing programs; codes similar to those used on typesetting machines are put into the text (e.g.,

\c to center a line on the page, \f3 to select the third font), and Fancy Font then produces proportionally-spaced, right-justified text. One can have up to 15 fonts available at the same time in a variety of sizes from illegibly small to one inch high; it is also possible to create fonts and special characters.

Slavica currently has the capability of printing all East European languages in both the Cyrillic and Roman alphabets, and in a variety of type sizes. We are using this program to set type for books and our catalogs. The program is cheap ($180), not copy protected, and the support is good. It can be used on a variety of printers; we are using chiefly the Epson RX-80, a $269 dot-matrix printer, and the ultimate resolution that we get is about the same as that on the Apple Laserwriter or the Hewlett-Packard Laserjet Plus. The big difference is speed: when printing out a page in full resolution, Fancy Font can take about 20 minutes (rough drafts for proofing are faster, although still in the 5 to 10 minute per page range). Given the price of the Epson QX-10 computer ($750) and the price of the printer ($269), one can have a full typesetting system for just over $1000, instead of at least $6000 for an IBM/Laserjet combination, or $8500 for a Macintosh/Laserwriter combination. Another good alternative might be a Leading Edge Model D computer ($1495) with an Epson dot-matrix printer, which would still keep the price under $2000 and would give full MS-DOS compatibility. Fancy Font will work on almost any CP/M or MS-DOS computer (although it needs a ram disk to achieve reasonable speed with multiple fonts), and is certainly the most cost-effective method of getting near-typeset quality print, but it is veeerrrryyy slooooowww and therefore not practical for an office where a single machine must be used all day for a variety of tasks.

Some other programs, such as Lettrix and Fontrix, will also produce Cyrillic, but they do not have the typesetting capabilities of Fancy Font, and they also print slowly (all these programs use the dot-matrix printer in graphics mode, which means that they run very slowly - Fancy Font uses six passes on each line in full resolution).

It seems clear that the future lies with laser printers, which are rapidly dropping in price and rising in capabilities, but at the present one must make some hard choices between price and speed, between ease of use and power. Based upon present hardware, the ultimate would probably be the Atari 520ST running a laser printer, but the software for this does not yet exist.